not only does it regain its strength when the circuit is inter-
rupted, but it recovers a part of it also, when instead of inter-
rupting the circuit the current itself is only slackened *.

[To be continued.]

XXXVIII. *Notices of the Results of the Labours of Continental
Chemists.   By Messrs.* W. FRANCIS *and* H. CROFT.

To Richard Taylor, Esq.

DEAR SIR,

WE have the honour to forward to you for insertion in
your valuable Journal, the accompanying notices of the
researches of Continental chemists.   We trust that, however
brief and imperfect, they may prove acceptable to English
readers, as but little of what is done abroad, especially in Ger-
many, seem ; to find its way into England, or, at least, until
after the lapse of some years.   As instances of this, we need
only refer to some papers by English chemists recently pub-
lished in the Philosophical Magazine, which in a great mea-
sure have been but repetitions of what has been done long
since on the Continent.   Thus Professor Apjohn would have
been spared a great deal of labour had he been earlier ac-
quainted with the works of Liebig and Pelouze, and, still
more, with those of Mulder.   Professor Johnston might have
been enabled to shorten his experiments on the Benzoe resins,
and probably would have modified his results, if he had known
of the researches of Van der Vloet on the same subject, with
whose formulæ some of Professor Johnston's results agree.
Our next communication shall furnish some comparison of
these two excellent investigations.   The double oxalates, or
at least several of them, which have been so well described by
Professor Graham in his celebrated paper on the constitution
of the Melates, &c. had been described already by Professor
Mitscherlich.   The fact that aldehyd is contained in nitrous
æther, as lately stated by Dr. Golding Bird, was known years
before in Germany from the labours of Heinrich Rose.

It is, however, needless to multiply instances : our object is
to assist in preventing their occurrence, and to save English
chemists some little unnecessary trouble.   It would, it is true,
be better to give full translations of the papers, but our own
studies do not allow us time for this:—the extracts, which
are made in our few leisure hours, are intended to give an

* See §. 11 of the Memoir already cited, upon the loss of tension which
electromotors undergo when the circle remains closed, and upon the re-
gaining of the primitive tension when the communication between the
poles is suspended.

idea, not of what has been done, but merely of what·is actually going on in the Continental chemical world.

Should our attempt meet your approval and that of your readers, we shall with pleasure continue our communication monthly. We have the honour to remain,

<div style="text-align:right">

Dear Sir, yours truly,
WILLIAM FRANCIS.
HENRY CROFT.

</div>

Berlin, Dec. 13, 1840.

P.S. The Journals consulted are Poggendorff's *Annalen der Physik und Chemie*; Liebig's *Annalen der Chemie und Pharmacie*; Erdmann's *Journal für Praktische Chemie*; *Archiv der Pharmacie*; *Annales de Chimie et de Physique*; *Journal de Pharmacie*; Berzelius's *Arsberattelse*, and the German translation by Wöhler.

MM. Dumas and Stas have published a second treatise on chemical types*. The principal subject of this treatise is the action of potassa on the various kinds of alcohol, both those which are evidently similar to the wine alcohol, and also on those substances which have been considered as analogous to alcohol, as for instance, glycerin, &c. In many cases it is possible to convert an alcohol into its equivalent acid ; but yet chemists have not been able to convert an acid into its corresponding alcohol. The discovery and examination of these alcohols is much more important than that of any acid; for the acid is only interesting in as far as its combinations with inorganic bases are concerned, while an alcohol is the head of a numerous family. A new alcohol may be compared to a new metal. The formula of the alcohol of any acid is found by substituting H^2 for O^2 in the hydrated acid.

In the experiments on the action of hydrate of potassa, it was found convenient to employ a mixture of equal parts of fused potassa and well-burnt lime. This substance affected the glass vessels much less than potassa alone; it may, for shortness' sake, be called lime-potassa.

If this substance be moistened with alcohol and subjected to a gentle heat, a gas is developed which consists chiefly of hydrogen, and a little carburetted hydrogen and carbonic oxide. The residue contained a quantity of acetic acid, proportional to the quantity of alcohol employed. If the heat is increased, carbonate of potassa remains behind, and marsh gas (light carburetted hydrogen) is given off; for under the influence of alkalies, acetic acid is decomposed into carbonic acid and marsh gas, $C^4 H^4 O^4 = C^2 O^4 + C^2 H^4$. In the usual preparation of acetic acid, two atoms of hydrogen are

* *Annalen der Chemie und Pharmacie*, xxxv. p. 129, from *Annales de Chimie et de Physique*, vol. lxvi. p. 113.

replaced by two atoms of oxygen; by the action of alkalies chloracetic acid $C^4 H Cl^3 O^4$ is decomposed into carbonic acid and chloroform $C^2 O^4 + C^2 H Cl^3$; acetic acid is decomposed into $C^2 O^4 + C^2 H^4$, or $C^2 O^4 + C^2 H^3 H$.   Alcohol may therefore be considered as composed of two bodies representing carbonic acid, one the methylic aldehyd, the other marsh gas, $C^4 H^6 O^2 = C^2 H^3 + C^2 H^2 O^2 =* C^2 O^4 + C^2 O^4$.   In the usual method of forming acetic acid $C^2 H^2 O^2$ loses H^2, and takes up O^2, there then remains $C^2 O^2 O^2 + C^2 H^4$ $= C^4 H^4 O^4$, or acetic acid.   By the action of alkalies H^4 is given off; the water of the hydrated alkali is decomposed, H^2 is developed and O^2 assimilated.   If the hydruret of potassium be treated with dilute sulphuric acid, the hydrogen of the hydruret is developed, and also that of an atom of water, the oxygen of which combines with the potassium to form potassa.   So it is with the body $C^2 H^2 O^2$, $C^2 H^2 O^2 - H^2 + O^2$ $= C^2 O^4$, we then have $C^2 O^4 + C^2 H^4 =$ acetic acid, as before. With pyroxylic spirit it is the same; two atoms of water are decomposed, $C^2 H^4 O^2 - H^2 + O^2$ (from $H^2 O^2$) gives $C^2 H^2 O^4 + H^4$.   In the residue, however, is found a large quantity of oxalic acid.   Peligot has shown that by the action of alkalies formic acid is converted into oxalic acid.   Hydrogen is thereby developed, $C^2 H^2 O^4 - H = C^2 H O^4$; the oxalic acid in its turn may lose H, and become $C^2 O^4$, or carbonic acid.

One part of ethal treated with 5–6 parts of lime-potassa, gave at 210° to 220° C. a considerable quantity of hydrogen. The residue, treated with hydrochloric acid, gave a flocky precipitate: this was combined by boiling with hydrate of baryta, and the salt thus formed freed from excess of ethal by boiling alcohol, and then decomposed by means of hydrochloric acid. The precipitate is ethalic acid.   The mixture for preparing it must not be heated above 220° C., and must be kept at that temperature for five or six hours.   Ethalic acid is colourless, tasteless, inodorous, lighter than water, easily fusible, solidifies at 55° C., and forms fine shining needles; insoluble in water, soluble in boiling alcohol and æther; volatile. Formula $C^{32} H^{32} O^4$.   The salts, excepting those of the alkalies, are insoluble in water and alcohol. $\overline{Fe^2 Eth}$ is dark yellow, $\overline{Co Eth}$ is rose-coloured, $\overline{Cu Eth}$ light green, $\overline{Ag Eth}$ easily decomposed.   The potash salt is formed by fusing ethalic acid with carbonate of potassa, and extraction with alcohol; it is white, with a pearly lustre, decomposed by excess of water;

---

* The sign here should represent *equivalency*, but not at all *equality*.—R. K.

insoluble in æther; formula $C^{32} H^{31} O^3 + \dot{K}$. Soda salt crystallizes in large tabular crystals.

One part of potatoe spirit oil treated at 200° with ten parts of lime-potassa, gave hydrogen and valerianic aldehyd; this is further decomposed into valeric acid, $C^{10} H^{12} O^2 - H^2$

$= C^{10} H^{10} O^2 . \dot{K} - H + O = C^{10} H^9 O^1 . \dot{K}$. The residue is distilled with sulphuric acid, the vapours condensed in a solution of carbonate of soda; out of this the pure valerianic acid may be procured by distillation with phosphoric acid. Specific gravity of the hydrated acid at $16°\cdot5$ C. $= 0·937$; boils at 175°, is not solid at $-15°$; decomposed by chlorine, not by iodine and bromine; by anhydrous phosphoric acid is decomposed into inflammable gases and valeron, &c. &c. Formula $C^{10} H^{10} O^4 = C^{10} H^9 O^1 + H O$; density of vapour $= 3·55$; found by experiment $= 3·67$. There is also a hydrate with three atoms of water. Many salts do not crystallize. The silver salt is anhydrous.

Chlorovalerisic acid is formed when dry chlorine is passed into valerianic acid without the aid of sunshine: the reaction is violent. The acid is semifluid, transparent, heavier than water, inodorous, burning taste; at $-18°$ still fluid; decomposed at 100–120°, with development of hydrochloric acid; combines with water; the impure acid must therefore not be washed. Formula $C^{10} H^7 Cl^3 O^4$.

Chlorovalerosic acid. Formed by passing chlorine through valerianic acid in the sunshine: the chlorine is driven out by a stream of carbonic acid. Semifluid, inodorous, burning bitter taste, heavier than water; not solid at $-18°$; decomposed above 150°. With water forms a hydrate. Aqueous solutions not precipitated by acid nitrate of silver, but the solutions in alcohol and æther are after a short time. Formula $C^{10} H^6 Cl^4 O^4$. Potash salt is similar to the valerianate. The acid is decomposed by an excess of alkali. The silver salt decomposes in the dark; chloride of silver and a peculiar body $C^{10} H^6 Cl^3 O^4$ are formed. Formula of the silver salt

$C^{10} H^5 Cl^4 O^3 . \dot{A}g$. The oily hydrate contains three atoms of water. The boiling point of valerianic acid varies with the quantity of water it contains; all three acids form hydrates with three atoms of water, and are herein similar to the triacetate and triphocenate of lead. By continued distillation of potatoe-oil with nitric acid the valerianic aldehyd is formed, also by acting on it with sulphuric acid and chromate of potassa, or binoxide of manganese. The aldehyd has the formula $C^{10} H^{10} O^2$.

Glycerin treated with lime-potassa in the same manner

gave hydrogen, and in the residue formic and acetic acids; a glycerinic acid could not be obtained.

Aceton is decomposed into carbonic acid and marsh gas, as Persoz has already stated.

By passing the vapours of aldehyd over the heated lime-potassa, hydrogen is developed, and the residue contains a large proportion of acetic acid, $C^4 H^4 O^2$ lose H and takes $O = C^4 H^3 O^3$; aldehyd therefore resembles the oil of bitter almonds.

Oxalic æther treated with potash gives hydrogen and acetic and carbonic acids; oxalate of potash and alcohol are first formed, out of these are produced carbonate of potash, acetic acid, and free hydrogen. Acetic æther gives hydrogen and acetic acid; benzoic æther gives hydrogen, benzoic and acetic acids; iodide of ethyl gives iodide of potassium and olefiant gas,

$C^4 H^5 I^2 + \dot{K} = C^4 H^4 + \dot{K} I^2 + H O *$. This æther forms with chlorine; chloride of ethyl and iodine is separated, $\frac{4}{10}$ E F is exactly similar to R F. Chloride of æthyl gives water, olefiant gas, and chloride of potassium; the vapour treated with ammonia gives chloride of ammonium and ole-fiant gas, $C^4 H^5 Cl^2 + N H^3 = C^4 H^4 + N H^4 Cl$. Common æther gives carbonic acid, marsh gas, and hydrogen; treated with chromate of potash and sulphuric acid it forms acetic acid.

Acetate of mæthyl-oxide gives hydrogen, formic and acetic acids; chloride of mæthyl gives hydrogen, chloride of potassium and formic acid, which is afterwards decomposed, $C^2 H^3 Cl + K O + H^2 O^2 = C^2 H O^3 + KCl + H^4$. Oxide of mæthyl gives hydrogen and formic acid. When the vapour of alcohol is passed over heated baryta, the following decompositions take place: first, hydrate of baryta and olefiant gas are formed; in the second stage, the produced hydrate decomposes the alcohol into acetic acid and hydrogen; and in the third, the acetate of baryta forms carbonate and marsh gas. The gas given off contains olefiant gas, marsh gas, and hydrogen, and perhaps some carbonic oxide.

It appears, therefore, that several alcohols are capable of producing their own peculiar acid. According to the researches of the late M. Delalande, camphor when treated with

---

* I do not know whether this method of writing organic bodies is known in England. Berzelius proposes to write the carbon above, the hydrogen below, the nitrogen in the middle; the oxygen to be expressed by dots, as before. Tartaric acid is $\frac{4}{4} \overset{\cdots}{T}$, Benzoic $\frac{14}{10} \overset{\cdots}{Bz}$, &c., &c.—H. C.

potash forms a peculiar acid, $=$ camphor $+$ water. $C^{20} H^{16} O^2$ forms $C^{20} H^{18} O^4$.

A tabular view of several acids, with their hypothetical types, which here follow, we have not thought necessary to add; the above short extract of this very important paper is only an outline, those who wish for more information must refer to the original paper.

The oil obtained by distilling the fresh plants of *Ruta graveolens* is yellowish-green, smells like the plants, tastes bitter and aromatic; sp. gr. $= 0\cdot837$ at $18°$ C. If allowed to stand some time over chloride of calcium and then distilled, it boils at $218°$, and the boiling point rose to $245°$. The sp. gr. of the colourless product varies from $0\cdot831$ to $0\cdot838$. Rational formula $C^{23} H^{28} + O^3$. Specific gravity of the vapour was found to be $7\cdot892$, ought to be $7\cdot690$; therefore the atom is equal to four volumes. The oil is soluble in sulphuric acid, and is precipitated by water; hydrochloric acid gas has no action; by chlorine and nitric acid it is decomposed. These experiments have been made by Dr. H. Will in Giessen. *(Annalen der Pharmacie,* xxxv. 235.*)*

Erdmann has examined the action of chlorine and bromine on indigo. The indigo-blue used for these experiments contained a little indigo-red, which is, however, of no consequence. Dumas's formula for indigo-blue is $C^{16} H^5 N O^2$; Erdmann's is $C^{32} H^{10} N^2 O^3$. When chlorine is passed into indigo-blue suspended in water, the blue colour changes to a grayish-green, and then to yellow. Hydrochloric acid remains in solution. It is best to employ a low temperature. When this mass is distilled with water a volatile substance passes over; it is called chlorindopten, or chloride of indopten; it is formed in very minute quantities; it may be purified by repeated distillations with water and sublimation; it is then obtained in the form of fine needles of a peculiar unpleasant smell; fuses to a colourless oil; is not very volatile; soluble in hot water, but very little in cold; soluble in alcohol. Formula $C^8 H^5 Cl^2 O$. It is, however, a compound of two substances. When heated with caustic potassa or its carbonate the disagreeable smell disappears, a substance passes over similar in appearance to chloride of indopten, but differing from it in not giving a sour solution with water. Erdmann calls it chlorindatmit (!), from ἀτμός. It is formed in very small quantities; its formula is $C^{12} H^4 Cl^3 O^2$. The residue, after distilling off the chlorindatmit, is crystalline, soluble in water, less so in alcohol; it is allowed to stand in the air and then extracted with alcohol. Out of this solution acids precipitate

chlorindoptenic acid. This body has a disagreeable smell, behaves similar to chlorindopten, reacts acid, gives with a salt of silver a voluminous yellow precipitate, with lead a white one. Formula of silver salt is $C^{12} H^2 Cl^3 . Ag$; formula of free acid $C^{12} H^3 Cl^3 O$.

After the chloride of indopten has been distilled off, the residue is boiled with a large quantity of water, a resinous matter remains behind, and the filtered solution deposits a a red body; on evaporation more is obtained, but less pure. This substance is dissolved in boiling alcohol; on cooling, reddish-yellow or brown crystals are deposited; these are chloride of isatin, with a little bichloride of isatin and resin: by repeated crystallizations it may be obtained pure. It is inodorous, bitter, may be heated to 160° C. without decomposition, above that temperature it is partly decomposed and partly sublimed; 100 parts of alcohol of 0·83 dissolve 0·453 parts of it. It is neutral, not altered by hydrochloric or sulphuric acids; is decomposed by nitric acid. Formula $C^{16} H^4 N Cl O^3$. Treated with caustic potassa it is dissolved with a yellow colour; it takes up an atom of water and forms chlorisatinic acid. The potash salt crystallizes easily, is purified by solution in alcohol, &c.; the acid cannot be separated when precipitated by an acid out of the potash salt; it decomposes and forms chloride of isatin, which body may in this manner be obtained perfectly pure. Potash salt explodes. Formula $C^{16} H^5 N Cl O^4 . K$. Silver salt is $C^{16} H^5 N Cl O^4 . Ag$. There are two salts with baryta, one with one atom of water, the other with three. The lead salt is at first yellow and gelatinous, but becomes flocculent and of a splendid red colour. The copper salt is at first yellowish-brown, but becomes granular and blood-red, &c., &c., &c. Bichloride of isatin remains in the alcoholic solution out of which the chloride has been obtained; out of this it may be obtained: of course the latter crystallizations are the freest from the protochloride. These two bodies are extremely similar; the bichloride differs from the other in being more soluble in alcohol, and the bichlorisatinate of potash gives with lead salts a yellow precipitate, which does *not* become red like the chlorisatinate. Bichloride of isatin is, when obtained from its aqueous solution, a yellowish-red granular powder; out of alcohol it crystallizes in red shining needles and tables; sometimes four-sided prisms may be recognised; it may be partly sublimed, but the greater part is decomposed; more soluble in water than the protochloride. 100 parts alcohol of 0·83 dissolve at 14° 3·40 parts. Formula

$C^{16} H^4 N Cl^2 O^3$. Treated with potash it forms a bichlorisatinic acid, which may be precipitated from its solution in potash by means of an acid, in form of a yellow powder ; this acid is tolerably soluble in water ; it is easily decomposed ; its aqueous solution decomposes at 60°, or even in the cold ; it contains one atom water of crystallization. (*Journal für Praktische Chemie.* Erdmann and Marchand, xix. 321).

The potash salt crystallizes in needles and leaves. Formula $C^{16} H^5 N Cl^2 O^4 . \dot{K}$; the crystallized salt contains two atoms of water. The baryta salt crystallizes in the same form, and contains two atoms of water. The copper salt is at first of the colour of hydrated oxide of iron, but becomes carmine red and granular ; when pressed assumes a golden lustre. The silver salt is partly soluble in water, and may be crystallized ; it is anhydrous.

The more of the resinous substance is formed the more chloride of indopten is produced ; it is not formed by the action of chlorine on the proto- or bichloride of isatin. The resin examined was not quite pure, for the product formed by the action of chlorine on indigo-red was always mixed with it ; it is obtained in small quantities. The formula appears to be $C^{20} H^8 Cl^2 N_{\frac{1}{2}} O^5$, or $C^{40} H^{16} Cl^4 N O^{10}$.

It is probable that the ammonia resin, and chloride of indopten are unimportant and variable products.

By the action of bromine similar substances are produced, bromide of indopten ; and by potassa, bromindatmit and bromindoptenic acid. They have apparently the same formula as the chlorine compounds ; also bromide of isatin and bromisatinic acid, bibromide of isatin and bibromisatinic acid : they have the same composition, and are in other respects very similar to the chlorine compounds.

In a second paper Professor Erdmann promises to make known the action of certain reagents on the bodies described above.

Formic æther may be prepared, according to Wœhler, by distilling a mixture of ten parts of starch, thirty-seven parts finely powdered binoxide of manganese, thirty parts of sulphuric acid, fifteen parts of water, and fifteen of mere alcohol. In the product of the distillation chloride of calcium is dissolved, and the æther distilled off in a water bath ; from the solution of chloride of calcium in the æther, small yellow crystals are sometimes deposited : they have not been further examined. (*Annalen der Chemie und Pharmacie*, xxxv. 238.)

According to Wœhler telluret of ethyl may be formed by distilling baryto-sulphate of ethyl oxide (sulphovinate of baryta) with telluret of sodium; the telluret, as obtained by fusing tellurium or telluret of bismuth with carbonate of soda and charcoal, is thrown into the baryta solution in a solid state. (*Poggendorff's Annalen*, l. 404.)

The æther is a yellowish-red fluid, like bromine, heavier than water, in which it is but little soluble; has a strong disagreeable smell, similar to sulphuret of ethyl and to telluretted hydrogen; appears to be poisonous; boils under 100°; inflammable, burns with a white flame with blue margin, in the air changes into tellurous acid. When acted on by the nitric and hydrochloric acids, an oily body is formed: contains 68·75 per cent. tellurium; it should contain 68·53. Formula C^4 H Te.

Mylius has found that *Helix pomatia, nemoralis* and *hortensis* (but no species of *Limnœa* or *Planorbis*) contain pure uric acid in a free state; it occurs in a glandular organ situated immediately beneath the shell,—which is therefore without doubt the urinary vesicle,—secreted in a solid form, so that it shines through the covering membrane. To obtain it, it is merely necessary to cut open the organ and squeeze out the white paste into a glass. When a sufficient quantity has been collected, it is shaken frequently with water, by which the slime is suspended and can be poured off, while the uric acid is deposited at the bottom of the vessel. This simple and mechanical operation suffices to obtain a perfectly pure product: it has a pulverescent appearance, and contains no crystalline particles. The quantity obtained from each garden snail amounts to about one and three-quarter grains. (*Journal für praktische Chemie,* xx. p. 509.)

Brucin is considered by Dr. Fuss of Schönebeck to be merely a mixture of strychnia with a resin, from which it may be separated by a peculiar method. Erdmann has made some experiments with the products obtained by Dr. Fuss. (*Journal für praktische Chemie*, xix. 510.)

For preparing the chlorate of barytes, Duflos dissolves thirteen and a half parts of chlorate of soda in double the quantity of water, to which he adds a solution of ten parts of tartaric acid in as much water, and pours the whole into a glass containing a double volume of alcohol. It is then left to stand for twenty-four hours, filtered, the acid liquid neutralized with pure carbonate of barytes, which has been previously mixed with water to a milk, the spirit left to evapo-

rate, then filtrated anew and evaporated to crystallization. The precipitate effected by the alcohol is the bitartrate of soda, which may again be employed for preparing chlorate of soda by adding it to a hot solution of sixteen parts of chlorate of potash in four times the quantity of water, leaving the mixture to cool, filtrating and evaporating the solution to forty parts. (*Arch. der Pharm.*, xxiii. p. 306.)

After continued rain, a heap of coals which lay exposed to the weather was observed to smoke, and to be on fire in the interior; when separated it was found in the middle to be in full combustion. In the neighbourhood of this part the coals were half-roasted, forming an almost compact mass, and between them was found a bright yellow, soft, saltlike substance. This proved on examination to be sulphate of magnesia; the ashes of coals contain magnesia, the burning pyrites afforded the sulphuric acid. Dr. Mohr compares it to the formation of cyanide of potassium at the Clyde iron-works*. How the sulphate of magnesia became collected into masses is not so easily explained. (*Annalen der Pharmacie*, xxxv. 239.)

Kersten has employed with advantage a mixture of hydrochloric acid and finely powdered chlorate of potash, added in small portions, as proposed by Berzelius for oxidizing and dissolving metals and metallic sulphurets, even for the analysis of the native metallic sulphurets, the sulphur being quickly and easily converted into sulphuric acid. M. Kersten, moreover, observed that finely powdered iron pyrites was perfectly decomposed by boiling with chlorate of potash, without any addition of acid, the sulphur being converted into sulphuric acid, and the iron remaining undissolved in the form of peroxide. (*Berzelius's Jahresbericht*, xix. p. 288.)

The difficulty of obtaining the hyposulphite of soda in good crystals, according to the usual methods, has induced C. F. Capaun to make known the following modified plan, by which in the shortest time considerable quantities of the salt can be prepared, and of a kind which leaves nothing further to be desired. A solution of caustic soda is boiled with sulphur so long as any of this is dissolved, the liquid poured from the undissolved sulphur put aside to cool, and then a current of sulphurous acid gas passed through it, until a test filtered from the separated sulphur has still a wine-yellow colour—it contains therefore still undecomposed sulphuret of sodium,—and by no means appears colourless. The liquid is now filtered and evaporated in a porcelain basin over a

[* Described by Dr. Clark in L. & E. Phil. Mag. vol. x. p. 329.—EDIT.]

quick fire to the consistency of a syrup. Although during evaporation the atmospheric air is not excluded, there is no fear of the hyposulphite of soda being more highly oxidized, as the oxygen of the atmosphere must first exert its oxidizing action on the sulphuret of sodium. The liquid thus evaporated is filtered, if necessary, and mixed with half its volume of alcohol and well shaken; in a few minutes the liquid separates into two layers; the upper or alcoholic one, which has taken up all the sulphuret, is of a gold-yellow colour, the lower one containing the hyposulphite of soda dissolved in water, colourless. The vessel is now placed aside, that the hyposulphite may crystallize under the covering of the alcoholic solution of the sulphuret, which happens in the course of twelve hours. The crystals obtained, when quantities not too small have been operated with, are of considerable size, and without any yellow tinge; and when dissolved in water and treated with an acid, let fall a considerable quantity of sulphur with disengagement of sulphurous acid. (*Journal für praktische Chemie*, xxi. pp. 310–313.)

Marchand prepares the dioxide of copper in the following manner: very thick wires of pure Russian copper were brought in a Gay-Lussac's furnace immediately to a violent white heat, which having continued half an hour, was diminished to a dark red heat: the oxide was taken out after some hours; it formed black crystalline masses, which were in part hollow, and gave a beautiful purple-red powder. In the greater part there was still metallic wire inside, around which the dioxide had arranged itself in a crystalline state. Another time the dark red heat was maintained during eight or nine hours. Both products were reduced by hydrogen; the first portion contained 88·6 copper and 11·4 oxygen, the second 88·65 Cn. and 11·35 O. (*Journal für praktische Chemie*, xx. p. 505.)

[To be continued.]

XXXIX. *Proceedings of Learned Societies.*

GEOLOGICAL SOCIETY.

Feb. 26, 1840.   **A** PAPER was then read, " On the characters of the
(*Continued.*)   fossil trees lately discovered near Manchester, on the line of the Manchester and Bolton railway; and on the formation of Coal by gradual subsidence;" by John Eddowes Bowman, Esq., F.L.S., communicated by the President.

The paper commences with a few preliminary remarks on the theory of repeated subsidences of the land during the carboniferous æra; and on the drift theory, the author being of opinion that the